

ABSTRACT

A method and apparatus for forwarding packets including fixed length cells in a multistage interconnection network are provided which are based on timestamping packets using a substantially system-wide timing reference and a novel application of merge sorting to restore packets to the proper order, using the timestamp information carried in the packets. A feature of the invention is a method for determining when packets passing along different paths in the network can be safely forwarded, even when no packets have recently been received on some of the paths. This is done using a mechanism that forwards status messages along otherwise idle paths, where the status messages provide information that can be used by downstream components to allow them to determine when packets passing over other paths can safely be forwarded. The invention simultaneously resequences packets being delivered to all n outputs of the multistage interconnection network. The resequencing operations are distributed among a plurality of switching elements making up the interconnection network. Sorting of packets can be accomplished by a plurality of switch elements thereby resequencing ordered sets of packets in a plurality of source buffers into ordered sets of packets in a plurality of destination buffers.